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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/594,592
Filing Date: September 28, 2006
Appellant(s): ORESTI ET AL.

Andrew Ollis
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 5 November 2010 appealing from the Office action mailed 3 March 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 15-28 are pending and rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. Claim 25 rejected under 35 U.S.C. 101; and claim 25 under 35 U.S.C. 112.

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

4,778,443	SANDS et al.	10-1988
WO 2000/011313	AAREBROT et al.	3-2000
3,075,918	HOLM	01-1963
4,339,917	LAGRONE	07-1982
6,537,349 B2	CHOI et al.	3-2003
5,195,587	WEBB	3-1993
4,967,559	JOHNSTON	11-1990

RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, at pages 167-194, 1976, Marcel Dekker, Inc.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 15-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313), HOLM (US 3,075,918) and LAGRONE (US 4,339,917).

For instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 delivering the gas/oil/water (fluid) from the offshore facility (field) to a high pressure gas/liquids separation stage.

Also for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 where the gas/oil/water (fluid) is split into a gas phase substantially consisting of petroleum gases (light hydrocarbon).

Additionally for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, oil/water (two liquid phases) one of which mainly consists of water, the other substantially of oil (hydrocarbon liquids).

In addition for instant **claims 15 and 17**, SANDS et al. does not teach delivering the light hydrocarbon gases, separated in the high pressure separation stage, to a reinjection gas compression unit having at least two compression stages. AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the

reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

Also for instant **claims 15 and 17**, SANDS et al. does not specifically teach delivering, **after heating**, the hydrocarbon liquid separated in the high pressure stage of separation to one or more further stages of gas/liquids separation operating at decreasing pressures. But for instant claim 15, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, delivering the oil (hydrocarbon liquid) separated in the high pressure stage of separation to one or more further stages of gas/liquids separation operating at medium-pressure and low-pressure (decreasing pressures). It would have been obvious to one having ordinary skill in the art at the time the invention was made to heat the hydrocarbon liquid, since it was known in the art that heating of petroleum oil (hydrocarbon liquid) provides the benefit of causing the dissolved carbon dioxide to be desorbed from the petroleum oil to help in flashing off the carbon dioxide from the hydrocarbon oil as taught by HOLM at column 2 lines 35-50.

Furthermore for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 where, in each stage, the oil and water with dissolved gas (liquid) is split into a gas phase essentially consisting of petroleum gases (light hydrocarbon), and oil/water (two liquid phases) one of which mainly consists of water, the other mainly of oil (hydrocarbon liquids).

What's more for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering to a centrifugal countercurrent liquid/liquid contactor (water treatment section) the water separated both in the first high pressure separation stage and in the medium-pressure and low-pressure (decreasing pressures) separation stages.

Still more for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering the petroleum gases (light hydrocarbon), which have been separated in the medium-pressure and low-pressure (decreasing pressure) separation stages to corresponding compression units (5 and 6) to recompress the gases.

As well for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 using compressors (5 and 6) to compress gases, except SANDS et al. does not specifically teach **(1)** the ejector type of compressor, and **(2)** the compressed gas exiting from the one of a plurality of compression stages of the reinjection gas compression unit as a driving fluid of each single ejector. It would have been obvious to one having ordinary skill in the art at the time the invention was made to **(1)** use ejectors as the type of compressor, since LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system.

Also for instant **claims 15 and 17**, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 **(2)** the compressed gas exiting from a compression stage of the centrifugal pump (compression unit) as the fluid directed to (driving fluid) the ejector. Also, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas compression unit discussed above in order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, AAREBROT et al. teaches at the figures and page 2 lines 30-32 a plurality of compression stages (C_1-C_5) of the reinjection gas compression unit. Also, the (compression unit) taught by LAGRONE is similar to the compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 the reinjection gas compression unit produces exhaust. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combining the prior art elements according to the known technique taught by LAGRONE to the base device taught by SANDS et al. and modified by AAREBROT et al. and HOLM in order to provide the predictable result of improving the suction capability of a fluid delivery system as taught by LAGRONE at column 1 lines 15-25.

For instant **claim 16, 18 and 19**, SANDS et al. does not specifically teach wherein the driving fluid of each single ejector is the compressed gas exiting from a second-last or from a last compression stage of the reinjection gas

compression unit. It would have been obvious to one having ordinary skill in the art at the time invention was made to wherein the driving fluid of each single ejector is the compressed gas exiting from a last compression stage of the reinjection gas compression unit, since it has been held that rearranging parts of an invention involves only routine skill in the art. (MPEP 2144.04 VI-C)

Alternatively, it would have been obvious to one having ordinary skill in the art at the time invention was made to try wherein the driving fluid of each single ejector is the compressed gas exiting from a last compression stage of the reinjection gas compression unit, since there was a finite number of identified predictable solutions.

For instant **claim 20**, SANDS et al. does not teach wherein each stage of compression of the reinjection gas compression unit comprises at least a biphasic separator to remove liquid particles, a compressor, and a heat exchanger to cool the compressed gas. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein each stage of compression (C_1-C_5) of the reinjection gas compression unit comprises at least a condensed water separator (biphasic separator to remove liquid particles)(U), a compressor (C_1-C_5), and a intercooler (heat exchanger)(K_2-K_6) to cool the compressed gas. It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of

AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claims 21 and 22**, SANDS et al. does not teach wherein **(1)** the compressed gas to be used as driving fluid is taken after the compressor **(2)** and before the cooling heat exchanger. But, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 wherein the compressed gas to be used as directed fluid (driving fluid) is taken after the centrifugal pump (compressor). AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas compression unit as discussed above for the obviousness to one of ordinary skill in the art of in order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, the (compression unit) taught by LAGRONE is similar to the compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 the reinjection gas compression unit produces exhaust.

For instant **claims 21 and 22,** it would have been obvious to one having ordinary skill in the art at the time invention was made to wherein the compressed gas to be used as driving fluid is taken after the compressor **(2)** before the cooling heat exchanger, since it has been held that rearranging parts of an invention involves only routine skill in the art. (MPEP 2144.04 VI-C)

Alternatively, it would have been obvious to one having ordinary skill in the art at the time invention was made to try wherein the compressed gas to be used as driving fluid is taken after the compressor **(2)** before the cooling heat exchanger, since there was a finite number of identified predictable solutions.

For instant **claim 23**, SANDS et al. does not teach wherein the reinjection gas compression unit includes three compression stages. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein the reinjection gas compression unit includes three compression stages (C_1-C_3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 24**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the last stage of separation at decreasing pressures is performed at 450 kPa (pressure). SANDS et al. does not teach the last stage of separation at decreasing pressures is performed at sub-atmospheric pressure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the last stage of separation at decreasing pressures is performed

at sub-atmospheric pressure, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (MPEP 2144.05 PART II-A)

For instant **claim 25**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the recompressed gases exiting from the compression units (5 and 6) are used as petroleum gas to a pipeline (i.e. fuel gases).

For instant **claim 26**, SANDS et al. does not teach wherein the recompressed gases exiting the compression units are sent to the reinjection gas compression unit. AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 28**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 the system is performed in a floating production unit.

Alternatively, claims 15-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313), HOLM (US 3,075,918), CHOI et al. (US 6,537,349 B2) and LAGRONE (US 4,339,917), and evidenced by WEBB (US 5,195,587) and JOHNSTON (US 4,967,559).

For instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 delivering the gas/oil/water (fluid) from the offshore facility (field) to a high pressure gas/liquids separation stage (1).

Also for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 6 lines 1-40, figure 1 and claim 1 where the gas/oil/water (fluid) is split into a gas phase substantially consisting of petroleum gases (light hydrocarbon).

Additionally for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, oil/water (two liquid phases) one of which mainly consists of water, the other substantially of oil (hydrocarbon liquids).

In addition for instant **claims 15 and 17**, SANDS et al. does not teach delivering the light hydrocarbon gases, separated in the high pressure separation stage, to a reinjection gas compression unit having at least two compression

stages. AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

Also for instant **claims 15 and 17**, SANDS et al. does not specifically teach delivering, **after heating**, the hydrocarbon liquid separated in the high pressure stage of separation to one or more further stages of gas/liquids separation operating at decreasing pressures. But for instant claim 15, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1, delivering the oil (hydrocarbon liquid) separated in the high pressure stage (1) of separation to further stages (3 and 4) of gas/liquids separation operating at medium-pressure and low-pressure (decreasing pressures). It would have been obvious to one having ordinary skill in the art at the time the invention was made to heat the hydrocarbon liquid, since it was known in the art that heating of petroleum oil (hydrocarbon liquid) provides the benefit of causing the dissolved carbon dioxide to be desorbed from the petroleum oil to help in flashing off the carbon dioxide from the hydrocarbon oil as taught by HOLM at column 2 lines 35-50.

Furthermore for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 where, in each stage (3 and 4), the oil and water with dissolved gas (liquid) is split into a gas phase essentially consisting of petroleum gases (light hydrocarbon), and oil/water (two liquid phases) one of which mainly consists of water, the other mainly of oil (hydrocarbon liquids).

What's more for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering to a centrifugal countercurrent liquid/liquid contactor (water treatment section) the water separated both in the first high pressure separation stage and in the medium-pressure and low-pressure (decreasing pressures) separation stages.

Still more for instant **claims 15 and 17**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 delivering the petroleum gases (light hydrocarbon), which have been separated in the medium-pressure and low-pressure (decreasing pressure) separation stages to corresponding compression units (5 and 6) to recompress the gases.

As well for instant **claims 15 and 17**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 using compressors (5 and 6) to compress gases, except SANDS et al. does not specifically teach **(1)** the ejector type of compressor, and **(2)** the

compressed gas exiting from the one of a plurality of compression stages of the reinjection gas compression unit as a driving fluid of each single ejector. Also, CHOI et al. teaches at the abstract and the figures a subsea flash gas compression system with an ejector (14) for compressing low pressure gas with a high pressure input. LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide **(1)** the ejector of CHOI et al. as the type of compressors, since LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system.

Alternatively, LAGRONE teaches at column 1 lines 5-30 prior art systems become cumbersome and relatively expensive due to utilization of electrical power for one or more fuel pumps. It would have been obvious to one having ordinary skill in the art at the time the invention was made to **(1)** the ejector of CHOI et al. as the type of compressors for the benefit of not utilizing electrical power.

Also for instant **claims 15 and 17**, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 **(2)** the compressed gas exiting from a compression stage of the centrifugal pump (compression unit) as the fluid directed to (driving fluid) the ejector. Also, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas

compression unit discussed above in order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, AAREBROT et al. teaches at the figures and page 2 lines 30-32 a plurality of compression stages (C_1-C_5) of the reinjection gas compression unit. Also, the non-ejector type compression unit taught by LAGRONE is similar to the non-ejector type compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 the reinjection gas compression unit produces exhaust. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combining the prior art elements according to the known technique taught by LAGRONE to the base device taught by SANDS et al. modified with CHOI et al., HOLM and AAREBROT et al. in order to provide the predictable result of improving the suction capability of a fluid delivery system as taught by LAGRONE at column 1 lines 15-25.

Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combining the prior art elements according to the known technique taught by LAGRONE to the base device taught by SANDS et al. modified with CHOI et al., HOLM and AAREBROT et al. for the benefit of not utilizing electrical power.

[WEBB (US 5,195,587) provides extrinsic evidence at the abstract and the figures an oil field production system with an ejector (43). Also, WEBB (US 5,195,587) provides extrinsic evidence at the figures and column 4 lines 50-55

passing the gas entrained water from an ejector into a reinjection system for injecting these fluids into an underground formation.]

[JOHNSTON (US 4,967,559) provides extrinsic evidence at the title and the figures a geothermal power plant with well reinjection (i.e. a reinjection system). Also, JOHNSTON provides extrinsic evidence at column 4 lines 64-67 of steam jet gas ejectors used; and steam jet gas ejectors are an alternative to mechanical gas compressors to compress gases.]

For instant **claim 16, 18 and 19**, SANDS et al. does not specifically teach wherein the driving fluid of each single ejector is the compressed gas exiting from a second-last or from a last compression stage of the reinjection gas compression unit. It would have been obvious to one having ordinary skill in the art at the time invention was made to wherein the driving fluid of each single ejector is the compressed gas exiting from a last compression stage of the reinjection gas compression unit, since it has been held that rearranging parts of an invention involves only routine skill in the art. (MPEP 2144.04 VI-C)

Alternatively, it would have been obvious to one having ordinary skill in the art at the time invention was made to try wherein the driving fluid of each single ejector is the compressed gas exiting from a last compression stage of the reinjection gas compression unit, since there was a finite number of identified predictable solutions.

For instant **claim 20**, SANDS et al. does not teach wherein each stage of compression of the reinjection gas compression unit comprises at least a biphasic separator to remove liquid particles, a compressor, and a heat exchanger to cool the compressed gas. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein each stage of compression (C_1-C_5) of the reinjection gas compression unit comprises at least a condensed water separator (biphasic separator to remove liquid particles)(U), a compressor (C_1-C_5), and a intercooler (heat exchanger)(K_2-K_6) to cool the compressed gas. It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claims 21 and 22**, SANDS et al. does not teach wherein **(1)** the compressed gas to be used as driving fluid is taken after the compressor **(2)** and before the cooling heat exchanger. But, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 wherein the compressed gas to be used as directed fluid (driving fluid) for the ejector is taken after the centrifugal pump (compressor). AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas compression unit as discussed above for the obviousness to one of ordinary skill in the art of in

order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, the non-ejector compression unit taught by LAGRONE is similar to the non-ejector compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, the figures particularly figures 1 and 2 the reinjection gas compression unit produces exhaust, and has a cooling heat exchanger (K_6).

For instant **claims 21 and 22,** it would have been obvious to one having ordinary skill in the art at the time invention was made to wherein the compressed gas to be used as driving fluid is taken after the compressor **(2)** before the cooling heat exchanger, since it has been held that rearranging parts of an invention involves only routine skill in the art. (MPEP 2144.04 VI-C)

Alternatively, it would have been obvious to one having ordinary skill in the art at the time invention was made to try wherein the compressed gas to be used as driving fluid is taken after the compressor **(2)** before the cooling heat exchanger, since there was a finite number of identified predictable solutions.

For instant **claim 23**, SANDS et al. does not teach wherein the reinjection gas compression unit includes three compression stages. But, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, page 2 lines 25-32, figure 1, and figure 2 wherein the reinjection gas compression unit includes three compression stages (C_1-C_3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the

petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 24**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the last stage of separation at decreasing pressures is performed at 450 kPa (pressure). SANDS et al. does not teach the last stage of separation at decreasing pressures is performed at sub-atmospheric pressure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the last stage of separation at decreasing pressures is performed at sub-atmospheric pressure, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (MPEP 2144.05 PART II-A)

For instant **claim 25**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 wherein the recompressed gases exiting from the compression units (5 and 6) are used as petroleum gas to a pipeline (fuel gases).

For instant **claim 26**, SANDS et al. does not teach wherein the recompressed gases exiting the compression units are sent to the reinjection gas

compression unit. But, SANDS et al. teaches at the figures and the abstract gases (i.e. recompressed gases) exiting the compression units (5 and 6). Also, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 28**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 the system is performed in a floating production unit.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313) and LAGRONE (US 4,339,917).

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 a treatment system for gas/oil/water (fluid) originating from an oil field,

a high pressure separator and at least a second lower pressure (medium-pressure) separator.

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 petroleum (oil) associated gases. Except, SANDS et al. does not teach one reinjection gas compression unit having at least two compression stages. But, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 27**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 at least a compression unit (5 and 6). For instant **claim 27**, SANDS et al. does not teach at least a compression unit equipped with a suitable ejector. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use ejectors as the type of compressor, since LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system.

Alternatively, Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over SANDS et al. (US 4,778,443) in view of AAREBROT et al. (WO 2000/011313), CHOI et al. (US 6,537,349 B2) and LAGRONE (US 4,339,917) and evidenced by WEBB (US 5,195,587) and JOHNSTON (US 4,967,559).

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 a treatment system for gas/oil/water (fluid) originating from an oil field, a high pressure separator (1) and a second lower pressure (medium-pressure) separator (3).

For instant **claim 27**, SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 petroleum (oil) associated gases. Except, SANDS et al. does not teach one reinjection gas compression unit having at least two compression stages. But, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, and figure 2 delivering oil associated gases (light hydrocarbon gases), to a reinjection gas compression unit having at least two compression stages (C_1-C_5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to process the petroleum (oil) gas of SANDS et al. with the reinjection system of AAREBROT et al., in order to retain the pressure of the reservoir in order to facilitate the oil recovery as taught by AAREBROT et al. at page 1 lines 15-20.

For instant **claim 27**, SANDS et al. does teach at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1, claim 1 and claim 13 a compression unit (5 and 6). Also, SANDS et al. does not teach at least a compression unit equipped with a suitable ejector. But, CHOI et al. teaches at the abstract and the figures a subsea flash gas compression system with an ejector (14) for compressing gas. LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the ejector of CHOI et al. as the compression unit, since LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system.

Alternatively, LAGRONE teaches at column 1 lines 5-30 prior art systems become cumbersome and relatively expensive due to utilization of electrical power for one or more fuel pumps. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the ejector of CHOI et al. as the compression unit for the benefit of not utilizing electrical power.

[WEBB (US 5,195,587) provides extrinsic evidence at the abstract and the figures an oil field production system with an ejector (43). Also, WEBB (US 5,195,587) provides extrinsic evidence at the figures and column 4 lines 50-55

passing the gas entrained water from an ejector into a reinjection system for injecting these fluids into an underground formation.]

[JOHNSTON (US 4,967,559) provides extrinsic evidence at the title and the figures a geothermal power plant with well reinjection (i.e. a reinjection system). Also, JOHNSTON provides extrinsic evidence at column 4 lines 64-67 of steam jet gas ejectors used; and steam jet gas ejectors are an alternative to mechanical gas compressors to compress gases.]

(10) Response to Argument

Appellant argues at page 5 particularly page 5 last paragraph, "The outstanding Office Action (i.e., the March 3, 2010 Office Action) relies on a complex combination of references to arrive at the presently claimed process. Applicant respectfully submits that it would not have been obvious to combine the four references as stated in the first ground of rejection because the addition of Lagrone would interfere with the purposes of Aarebrot et al., there is no reason to add Holm, Lagrone is non-analogous art, and the references do not suggest using a gas exiting from a reinjection compression unit as a driving fluid for an ejector. Instead, the outstanding Office Action uses impermissible hindsight to string together the four references without consistent respect for the purpose for which each feature is reportedly added to the base Sands et al. reference."

In response to Appellants argument(s) at page 5 last paragraph with regard to "the addition of Lagrone would interfere with the purposes of Aarebrot et al."

Respectfully, the Examiner does not find the Appellant's argument persuasive.

First, the last rejection dated 3 March 2010 (also referred to "last rejection" in the answer) did not combine LAGRONE and AAREBROT et al. alone. The features of LAGRONE and AAREBROT et al. were combined with SANDS et al.

Secondly, motivation from LAGRONE to provide an ejector to pump fluid supports the purposes of AAREBROT et al., because the ejector of LAGRONE aids the device of AAREBROT et al. in receiving the fluid that it works upon. The device of AAREBROT et al. works upon fluid (See Abstract). Providing the ejector (i.e. compressor) of LAGRONE in the last rejection aids in supplying that fluid to the device of AAREBROT et al., which is contradictory to Appellant's argument.

In response to Appellants argument(s) at page 5 last paragraph with regard to "there is no reason to add Holm," the Examiner does not find the Appellant's argument persuasive.

Reasoning was provided in the rejection, at least, at page 8 of the last rejection dated 3 March 2010. Page 8 second paragraph states, "since it was known in the art that heating of petroleum oil (hydrocarbon liquid) provides the

benefit of causing the dissolved carbon dioxide to be desorbed from the petroleum oil to help in flashing off the carbon dioxide from the hydrocarbon oil as taught by HOLM at column 2 lines 35-50."

In response to Appellants argument(s) at page 5 last paragraph with regard to "Lagrone is non-analogous art."

Respectfully, the Examiner does not find the Appellant's argument persuasive.

First, in response to appellant's argument that LAGRONE is nonanalogous art, it is noted that a similarity in the structure between LAGRONE and the current application is that both take an exhaust fuel gas from a compressor to drive an ejector.

Secondly, in response to appellant's argument that LAGRONE is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the prior art reference is in the field of appellant's endeavor, fuel delivery system.

For support it is noted that instant claim 25 has the phrase,

"wherein the recompressed gases exiting from the compression units are

used as **fuel** gases." (bolding added for emphasis) Also, LAGRONE states at the abstract "fuel delivery system."

Thirdly, in this case LAGRONE is reasonably pertinent to the particular problem with which the appellant was concerned. A problem trying to be solved by Appellant as noted at instant specification page 3 is providing static equipment in place of rotary machines because of a higher availability. RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, at page 167 provides extrinsic evidence that ejectors have no moving parts (i.e. static), and the ejectors have no rotating parts. Therefore, one would have been drawn to references with ejectors such as LAGRONE, since they describe ejectors that have no moving parts (i.e. higher availability).

Fourthly, in this case LAGRONE is reasonably pertinent to the particular problem with which the appellant was concerned. A problem trying to be solved by Appellant as noted at instant specification page 3 "space occupied on the deck." RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, at page 167 provides extrinsic evidence that ejectors are smaller than other compressor equipment. Therefore, one would have been drawn to references with ejectors such as LAGRONE, since ejectors have smaller sizes of equipment (i.e. less space occupied on the deck).

Fifthly, in this case LAGRONE is reasonably pertinent to the particular problem with which the Appellant was concerned. A problem trying to be solved by Appellant as noted at instant specification page 3 is "maintenance costs." RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, at page 167 provides extrinsic evidence that ejectors have less maintenance requirements. Therefore, one would have been drawn to references with ejectors such as LAGRONE, since ejectors have less maintenance requirements.

In response to Appellants argument(s) at page 5 last paragraph with regard to "the references do not suggest using a gas exiting from a reinjection compression unit as a driving fluid for an ejector."

Respectfully, the Examiner does not find the Appellant's argument persuasive. First, it is noted that an ejector **requires** a driving fluid to operate. (bolding added for emphasis) (For additional support see extrinsic evidence RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, page 168)

Secondly in response to the argument, the last rejection states at pages 9-10, "It would have been obvious to one having ordinary skill in the art at the time the invention was made to **(1)** use ejectors as the type of compressor, since

LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system."

Also for instant **claims 15 and 17**, LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 **(2) the compressed gas exiting from a compression stage of the centrifugal pump (compression unit) is used as the fluid directed to (driving fluid) the ejector**. Also, AAREBROT et al. teaches at page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 using a reinjection gas compression unit discussed above in order to retain the pressure of the reservoir in order to facilitate the oil recovery. Also, AAREBROT et al. teaches at the figures and page 2 lines 30-32 a plurality of compression stages (C_1-C_5) of the reinjection gas compression unit. Also, the compression unit taught by LAGRONE is similar to the compression unit taught by AAREBROT et al. Furthermore, AAREBROT et al. teaches at the abstract, page 1 lines 15-20, page 4 lines 1-30, figure 1, figure 2 the reinjection gas compression unit produces exhaust. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the prior art elements according to the known technique taught by LAGRONE to the base device taught by SANDS et al. and modified by AAREBROT et al. and HOLM in order to provide the predictable result of improving the suction capability of a fluid delivery system as taught by LAGRONE at column 1 lines 15-25. " (some additional bolding added for emphasis) Therefore, the last rejection showed that

the references do suggest using a gas exiting from a reinjection compression unit as a driving fluid for an ejector, which is contradictory to Appellant's assertion.

In response to Appellants argument(s) at page 5 last paragraph with regard to "the outstanding Office Action uses impermissible hindsight."

Respectfully, the Examiner does not find the Appellant's argument persuasive.

In response to Appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Appellant argues at page 6 first paragraph, "To find these features admittedly missing in Sands et al., the Office Action relies upon three diverse references."

Respectfully, the Examiner does not find the Appellant's argument persuasive.

First, the Examiner disagrees with the Appellant's characterization of the references as diverse references.

SANDS et al., AAREBROT et al., and HOLM are references that all are clearly in the gas and petroleum production field. Also, LAGRONE is explicitly disclosed in the fuel delivery field which is the same as the references of SANDS, AAREBROT, and HOLM.

More detailed support of the references not being diverse references as characterized by Appellant is provided as follows: It is noted that SANDS et al. states at the abstract, "An improved system and method of gas and petroleum production." Also, AAREBROT et al. states at page 1 lines 5-7, "The present invention relates to a system for the production of power/heat on an oil installation," and AAREBROT et al. states at page 1 lines 16 and 17, "Under certain conditions during oil recovery the natural gas that usually is produced together with the oil (associated gas)" (i.e. AAREBROT deals with gas and petroleum production). Therefore, AAREBROT et al. and SANDS et al. are not diverse references, which is contrary to Appellant's argument.

Furthermore, HOLM states at column 1 lines 8-12, "This invention relates to the recovery of oil from petroleum- bearing geological reservoirs and to an improvement over the conventional type of gas-injection recovery method" (i.e. AAREBROT deals with gas and petroleum production). Therefore, HOLM and

SANDS et al. are not diverse references, which is contrary to Appellant's argument.

First, in response to Appellant's argument that LAGRONE is nonanalogous art, it is noted that a similarity in the structure between LAGRONE and the current application is that both take an exhaust fuel gas from a compressor to drive an ejector.

Secondly, in response to Appellant's argument that LAGRONE is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the prior art reference is in the field of appellant's endeavor, fuel delivery system.

For support it is noted that instant claim 25 has the phrase, "wherein the recompressed gases exiting from the compression units are used as **fuel** gases." (bolding added for emphasis) Also, LAGRONE states at the abstract "fuel delivery system."

Thirdly, in this case LAGRONE is reasonably pertinent to the particular problem with which the Appellant was concerned. A problem trying to be solved

by Appellant as noted at instant specification page 3 is providing static equipment in place of rotary machines because of a higher availability. RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, at page 167 provides extrinsic evidence that ejectors have no moving parts (i.e. static), and the ejectors have no rotating parts. Therefore, one would have been drawn to references with ejectors such as LAGRONE, since they describe ejectors that have no moving parts (i.e. higher availability).

Fourthly, in this case LAGRONE is reasonably pertinent to the particular problem with which the Appellant was concerned. A problem trying to be solved by Appellant as noted at instant specification page 3 "space occupied on the deck." RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, at page 167 provides extrinsic evidence that ejectors have smaller sizes of equipment. Therefore, one would have been drawn to references with ejectors such as LAGRONE, since ejectors have smaller sizes of equipment (i.e. less space occupied on the deck).

Fifthly, in this case LAGRONE is reasonably pertinent to the particular problem with which the Appellant was concerned. A problem trying to be solved by Appellant as noted at instant specification page 3 is "maintenance costs." RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, at page 167 provides extrinsic evidence that

ejectors have less maintenance requirements. Therefore, one would have been drawn to references with ejectors such as LAGRONE, since ejectors have less maintenance requirements.

Lastly, in response, the MPEP states at 2145 PART V, "Reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. In re Gorman, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991) (Court affirmed a rejection of a detailed claim to a candy sucker shaped like a thumb on a stick based on thirteen prior art references.)."

Appellant argues at page 6 second paragraph, "At this point it should be noted that the Sands et al. invention was made in response 'to the long-existing need for reducing the size and weight of the gas and petroleum production facilities in certain particular circumstances, such as those found on offshore and arctic production structures.' Col. 2, lines 36-42; see also, col. 2, lines 26-28. Yet, as described below, each of the process steps missing in Sands et al. require adding additional structures (thus adding size and weight) in order to achieve the claimed combination according to the logic of the Office Action."

Respectfully, the Examiner does not find the Appellant's argument persuasive. First, it is noted that the Appellant is selectively quoting SANDS et

al. SANDS et al. actually states at column 2 lines 36-42, "The present invention arises from the application of a known device, the centrifugal countercurrent liquid/liquid contactor (CLLC), to respond to the long-existing need for reducing the size and weight of gas and petroleum production facilities in certain particular circumstances, such as those found on offshore and arctic production structures." SANDS et al. actually is referring to the centrifugal countercurrent liquid/liquid contactor (CLLC), to respond to the reduced size and weight, and not the entirety of the device of SANDS. Also, it is noted that the centrifugal countercurrent liquid/liquid contactor (CLLC) is item 10 at figure 1 of SANDS. Item 10 is only a single component out of the numerous components described by SANDS.

Secondly, it is noted that the statement "to the long-existing need for reducing the size and weight of the gas and petroleum production facilities in certain particular circumstances, such as those found on offshore and arctic production structures," is for the intended location of the device (i.e. offshore and arctic production). The instant claims are not limited to the intended location of the device (i.e. offshore and arctic production). Other locations exist where gas and petroleum production facilities are used such as onshore.

It is noted that the MPEP states at 2145 PART D-1, "A prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness; however, "the nature of the teaching is

highly relevant and must be weighed in substance. A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." In re Gurley, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994) (Claims were directed to an epoxy resin based printed circuit material. A prior art reference disclosed a polyester-imide resin based printed circuit material, and taught that although epoxy resin based materials have acceptable stability and some degree of flexibility, they are inferior to polyester-imide resin based materials. The court held the claims would have been obvious over the prior art because the reference taught epoxy resin based material was useful for applicant's purpose, applicant did not distinguish the claimed epoxy from the prior art epoxy, and applicant asserted no discovery beyond what was known to the art.)."

Also, it is noted that the nature of the teaching of SANDS et al. particularly at column 2 lines 36-42 is for "certain particular circumstances, such as those found on offshore and arctic production structures." The instant claims are not limited to the intended location of the device (i.e. offshore and arctic production). Other locations exist where gas and petroleum production facilities are used. SANDS et al. teaches at column 2 lines 56-58 that the invention can be used onshore. The previous statement of SANDS et al. of "to the long-existing need for reducing the size and weight of the gas and petroleum production facilities in certain particular circumstances, such as those found on **offshore and arctic production structures**," would have little significance to the device of SANDS

used onshore. Therefore, the statement of SANDS et al. would have little weight to the instant claims which are not limited to the intended location of the device.

Thirdly, an increase in size and weight is a relative term. The terms size and weight is relative to the offshore rig utilized. It is unclear what one of ordinary skill at the time of the invention would consider to be an increase in size and weight.

Fourthly, it is pointed out that the Appellant has not provided evidence that any of the additional equipment in the rejection would increase size and weight. Furthermore assuming arguendo, it is noted that in the last rejection ejectors were provided in place of the compressors of SANDS et al. Ejectors are smaller than other compressors, and ejectors are the simplest of all the present-day types of vacuum-producing equipment available (See extrinsic evidence RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, pages 167). Therefore, it is assumed that any additional weight or size from other additions is offset by the ejectors substituting the compressors (5 and 6) of SANDS et al.

Appellant argues at page 6 last paragraph - page 7 second paragraph, "Not surprisingly, since the exhaust gas of Aarebrot et al. is used for reinjection and desired control of

reservoir pressure, there is no disclosure or suggestion in Aarebrot et al. to divert some of the gas exiting a compression stage to drive an ejector."

Respectfully, the Examiner does not find the Appellant's argument persuasive. Respectfully, the Appellant is not arguing the rejection made.

First, it is noted that SANDS suggests at column 6 lines 33-34 using a reinjection system.

Secondly, the instant claims do not recite "some of the gas exiting a compression stage to drive an ejector."

Thirdly, the last rejection did not use AAREBROT to teach diverting some of the gas exiting a compression stage to drive an ejector.

Also, it is noted that the last rejection dated 3 March 2010 at least states at page 10 first paragraph, "LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 that the compressed gas exiting from a compression stage of the centrifugal pump (compression unit) is used as the fluid directed to (driving fluid) the ejector."

Appellant argues at page 7 last paragraph – page 8 second paragraph about actively absorbing carbon dioxide into oil, liquid reinjection, and a combustion step.

Respectfully, the examiner does not find these arguments persuasive. The arguments are not particularly discussing claimed limitations.

Also, the arguments are highly suspect as to whether they are actually arguing the combination made in the last rejection dated 3 March 2010. This will be further discussed as follows.

Appellant argues at page 7 last paragraph—page 9 first paragraph, "Holm discloses first actively absorbing carbon dioxide into oil and then injecting into the reservoir an oil solution containing carbon dioxide ahead of carbon dioxide reinjection gas in order to boost oil recovery. Col. 1, lines 8-34; col. 2, lines 69-72; col. 3, lines 67-72."

Respectfully, the Examiner does not find this argument persuasive.

First, HOLM does not explicitly recite "first actively absorbing carbon dioxide into oil."

Secondly, the Appellant is not specifically arguing the combination made in the last rejection dated 3 March 2010.

This is supported by Appellants characterization of the Office Action at page 7 paragraph 3, "The Office Action asserts that it would have been obvious to add heating to **desorb** carbon dioxide from the hydrocarbon oil as disclosed by Holm." (bolding added for emphasis) Desorbing carbon dioxide from the hydrocarbon oil is the opposite of absorbing carbon dioxide into the oil. Therefore, the Appellant's statement supports that the Appellant is not specifically arguing the rejection made.

Thirdly, the instant claims do not recite "actively absorbing carbon dioxide into oil and then injecting into the reservoir an oil solution containing carbon dioxide ahead of carbon dioxide reinjection gas in order to boost oil recovery." Appellant's argument is not commensurate in scope with the claims.

Fourthly, it is noted that, SANDS in combination with AAREBROT et al. teaches adding gas into the well to increase yield (i.e. reinjection). HOLMS teaches heating of petroleum oil aids in desorbing carbon dioxide from the oil, and the desorbed carbon dioxide can be injected into the well to increase yield. Respectfully, the Appellant is not specifically arguing the benefit of increasing yield.

Appellant argues at page 8 first paragraph, "The Office Action (page 8) specifically relies on col. 2, lines 35-50 in Holm. The cited section of Holm does not relate to heating before separating hydrocarbon into gas and liquid where the separation is into two liquid phases, one of which is mainly water, as recited in claim 15."

Respectfully, the Examiner does not find this argument persuasive. First it is noted that the Appellant is not specifically arguing the combination made in the last rejection.

Also in rebuttal, HOLM actually does relate to "heating before separating hydrocarbon into gas and liquid where the separation is into two liquid phases,

one of which is mainly water." HOLM teaches at column 2 lines 35-50 heating before flashing off carbon dioxide from oil (i.e. heating before separating hydrocarbon into gas and liquid). Therefore, the Appellant has failed to specifically support how HOLM does not relate to heating before separating hydrocarbon into gas and liquid where the separation is into two liquid phases, one of which is mainly water, as recited in claim 15.

Appellant argues at page 8 first paragraph, "In fact, Sands et al. as modified by Aarebrot et al. does not include both liquid reinjection as well as gas reinjection, which is the reason the oil of Holm includes carbon dioxide in the first place."

Respectfully, the Examiner does not find this argument persuasive. The Appellant is not specifically arguing the combination made in the last rejection.

Secondly, the instant claims do not include both liquid reinjection as well as gas reinjection. Therefore, Appellant's argument is not commensurate in scope with the claims.

Thirdly, SANDS et al. as modified by AAREBROT et al. includes reinjection (See AAREBROT et al. abstract, and/or SANDS et al. column 6 lines 33-34).

Appellant argues at page 8 first paragraph, "burning of gas or hydrocarbon is undesirable according to Aarebrot et al. which is concerned about environmental damage and seeks to reduce the emission of harmful gases."

Respectfully, the Examiner does not find this argument persuasive.

First, it is noted that the Appellant has failed to provide a showing of evidence that "burning of gas or hydrocarbon is undesirable according to Aarebrot et al.

Secondly, the instant claims do not recite a "burning of gas or hydrocarbon."

Thirdly, the rejection made does not necessarily involve a combustion step.

Fourthly, AAREBROT et al. is not the base reference. SANDS et al. is the base reference.

Fifthly, AAREBROT et al. states at the abstract, "In order to reduce discharge of environmentally harmful gases, particularly CO_2, hot exhaust gas (G) from gas turbines used on oil recovery installations is injected into the oil reservoir." So, if the Appellant's products of the burning of gas or hydrocarbon were injected into the oil reservoir, then this would actually be consistent with AAREBROT et al. The injection into the oil reservoir would be a reduction of a discharge of environmentally harmful gases.

Appellant argues at page 8 second paragraph, "In addition, the combination of Sands et al. and Aarebrot et al. does not include a combustion step that adds carbon dioxide to be absorbed into oil in the first place and later desorbed as disclosed in Holm. Thus, adding the heating of Holm necessarily requires a combustion process, a carbon dioxide absorption process, and a liquid reinjection process to be added to the base combination of Sands et al. and Aarebrot et al. for the heating of Holm to serve the purpose relied upon by the Office Action."

Respectfully, the Examiner does not find this argument persuasive.

First, it is noted that the instant claims do not recite "a combustion step that adds carbon dioxide to be absorbed into oil in the first place and later desorbed."

Also, it is noted that the instant claims do not recite "a combustion process, a carbon dioxide absorption process, and a liquid reinjection process."

Secondly, the Appellant is not specifically arguing the combination made in the last rejection dated 3 March 2010.

Thirdly, the Appellant's arguments are unclear. Merely, because SANDS et al. and AAREBROT et al. might not include a combustion step that adds carbon dioxide to be absorbed into oil does not mean that "a combustion process, a carbon dioxide absorption process, and a liquid reinjection process" must be added to the base reference.

Appellant argues at page 8 second paragraph, "Since there are no combustion and liquid reinjection steps in the Sands et al./Aarebrot et al. combination, there would be no reason that a person of ordinary skill in the art would be taught by Holm to heat the hydrocarbon as recited in claim 15."

Respectfully, the Examiner does not find this argument persuasive. There are reasons for adding the heat, contrary to Appellant's assertion. Reasons for adding the heat can be to help desorb carbon dioxide from the oil, and to aid in increasing yield. (See page 8 last paragraph of Appeal Brief and the last rejection dated 3 March 2010 page 8 second paragraph)

Appellant argues at page 7 third paragraph - page 9 first paragraph, "The Office Action's reasoning for adding Holm is flawed and would be rejected by a person of ordinary skill in the art for several reasons"..." As noted above, the Office Action relies upon Holm's disclosure of heating hydrocarbons for the purpose of carbon dioxide removal so that the carbon dioxide could be reinjected into the reservoir to boost production. However, the Office Action had already relied upon and added the reinjection compression unit of Aarebrot et al. to Sands et al. for the same purpose. Thus, the addition of Holm is also redundant of Aarebrot et al."

Respectfully, the Examiner does not find this argument persuasive.

There is nothing wrong with making different modifications to increase the same benefit. The reinjection system of AAREBROT et al. and the heating step of HOLM each adding to an increase in production is an acceptable rationale for a rejection.

Appellant argues at page 7 third paragraph - page 9 first paragraph, "in addition to being inconsistent with Aarebrot et al. by necessarily involving an additional environmentally unfriendly combustion step."

Respectfully, the Examiner does not find this argument persuasive.

First, the instant claims do not recite a combustion step.

Secondly, AAREBROT et al. is not the base reference. SANDS et al. is the base reference.

Thirdly, the rejection made does not necessarily involve a combustion step.

Fourthly, AAREBROT et al. states at the abstract, "In order to reduce discharge of environmentally harmful gases, particularly CO_2, hot exhaust gas (G) from gas turbines used on oil recovery installations is injected into the oil reservoir." So, if the Appellant's products of the combustion step were injected into the oil reservoir, then this would actually be consistent with AAREBROT et al. The injection into the oil reservoir would be a reduction of a discharge of environmentally harmful gases.

Appellant argues at page 7 third paragraph - page 9 first paragraph, "would effectively add still more equipment to a base reference (.Sands et al.) which has as its stated purpose the goal of reducing the weight and size of oil platforms."

Respectfully, the Examiner does not find this argument persuasive.

First, SANDS et al. does not state "the goal of reducing the weight and size of oil platforms."

Respectfully, the Appellant is not taking full measure of what SANDS et al. actually does state with consideration given to the nature of the teaching.

MPEP states at 2145 PART D-1,

> "the nature of the teaching is highly relevant and must be weighed in substance."

SANDS et al. actually states at column 2 lines 36-42, "The present invention arises from the application of a known device, the centrifugal countercurrent liquid/liquid contactor (CLLC), to respond to the long-existing need for reducing the size and weight of gas and petroleum production facilities in certain particular circumstances, such as those found on offshore and arctic production structures." SANDS et al. actually is referring to the centrifugal countercurrent liquid/liquid contactor (CLLC), to respond to the reduced size and weight, and not the entirety of the device of SANDS. Also, it is noted that the centrifugal countercurrent liquid/liquid contactor (CLLC) is item 10 at figure 1 of SANDS. Item 10 is only a single component out of the numerous components described by SANDS.

Secondly, it is noted that the statement "to the long-existing need for reducing the size and weight of the gas and petroleum production facilities in certain particular circumstances, such as those found on offshore and arctic production structures," is for the intended location of the device (i.e. offshore and arctic production). The instant claims are not limited to the intended location of the device (i.e. offshore and arctic production). Other locations exist where gas and petroleum production facilities are used such as onshore.

Also, it is noted that the nature of the teaching of SANDS et al. particularly at column 2 lines 36-42 is for "certain particular circumstances, such as those found on offshore and arctic production structures." The instant claims are not limited to the intended location of the device (i.e. offshore and arctic production). Other locations exist where gas and petroleum production facilities are used. SANDS et al. teaches at column 2 lines 56-58 that the invention can be used onshore. The previous statement of SANDS of "to the long-existing need for reducing the size and weight of the gas and petroleum production facilities in certain particular circumstances, such as those found on **offshore and arctic production structures**," would have little significance to the device of SANDS used onshore. Therefore, the statement of SANDS would have little weight to the instant claims which are not limited to the intended location of the device.

Thirdly, an increase in size and weight is a relative term. The terms size and weight is relative to the offshore rig utilized. It is unclear what one of

ordinary skill at the time of the invention would consider to be an increase in size and weight.

Fourthly, it is pointed out that the Appellant has not provided evidence that any of the additional equipment in the rejection would increase size and weight. Furthermore assuming arguendo, it is noted that in the last rejection ejectors were provided in place of the compressors of SANDS. Ejectors are smaller than other compressors, and ejectors are the simplest of all the present-day types of vacuum-producing equipment available (See extrinsic evidence RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, pages 167). Therefore, it is assumed that any additional weight or size from other additions is offset by the ejectors substituting the compressors (5 and 6) of SANDS.

Appellant argues at page 9 second paragraph, "In any event, there is certainly no disclosure or suggestion in Holm to use the gas exiting a compression stage to drive an ejector. Accordingly, Holm does not cure this further deficiency in the combination of Sands et al. and Aarebrot et al."

Respectfully, the Examiner does not find this argument persuasive. The Appellant is not specifically arguing the rejection made.

In response to Appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Also, it is noted that the last rejection dated 3 March 2010 at least states at page 10 first paragraph, "LAGRONE teaches the technique at column 1 lines 45-68, column 2 lines 15-50 and figure 1 that the compressed gas exiting from a compression stage of the centrifugal pump (compression unit) is used as the fluid directed to (driving fluid) the ejector."

Additionally, to support the Examiner's position it is noted that an ejector requires a driving fluid to operate. (See extrinsic evidence RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, page 168) [WEBB (US 5,195,587) provides extrinsic evidence at the abstract and the figures an oil field production system with an ejector (43). Also, WEBB (US 5,195,587) provides extrinsic evidence at the figures and column 4 lines 50-55 passing the gas entrained water from an ejector into a reinjection system for injecting these fluids into an underground formation.]

[JOHNSTON (US 4,967,559) provides extrinsic evidence at the title and the figures a geothermal power plant with well reinjection (i.e. a reinjection

system). Also, JOHNSTON provides extrinsic evidence at column 4 lines 64-67 of steam jet gas ejectors used; and steam jet gas ejectors are an alternative to mechanical gas compressors to compress gases.]

Appellant argues at page 9 third paragraph, "The Office Action asserts that it would have been obvious to combine the ejector receving [sic] exhaust flow from a pump (compressor) of Lagrone with the system of Sands et al. as modified by Aarebrot et al. et al. and Holm in order to improve suction capability of a fluid delivery system. Office Action at 10".

Respectfully, the Examiner does not find this argument persuasive. The Appellant is not quoting the Office Action.

The Office Action at least states at page 9 last paragraph, "It would have been obvious to one having ordinary skill in the art at the time the invention was made to **(1)** use ejectors as the type of compressor, since LAGRONE teaches at column 1 lines 5-30 it is known that utilization of an ejector pump improves the suction capability of a fluid delivery system."

It is noted that the last rejection states at page 9 last paragraph, "SANDS et al. teaches at the abstract, column 3 lines 50-68, column 4 lines 34-45, column 6 lines 1-40, figure 1 and claim 1 using compressors (5 and 6)." Therefore, the rejection was a mere substitute of one type of compressor for another.

[WEBB (US 5,195,587) provides extrinsic evidence at the abstract and the figures an oil field production system with an ejector (43). Also, WEBB (US 5,195,587) provides extrinsic evidence at the figures and column 4 lines 50-55 passing the gas entrained water from an ejector into a reinjection system for injecting these fluids into an underground formation.]

[JOHNSTON (US 4,967,559) provides extrinsic evidence at the title and the figures a geothermal power plant with well reinjection (i.e. a reinjection system). Also, JOHNSTON provides extrinsic evidence at column 4 lines 64-67 of steam jet gas ejectors used; and steam jet gas ejectors are an alternative to mechanical gas compressors to compress gases.]

Appellant argues at page 9 paragraph 3-page 10 second paragraph (and page 5 last paragraph), "Finally, the Office Action turns far away from the field of oil recovery, particularly marine oil recovery and its associated issues, to Lagrone where the only specifically described application is gas turbine engines such as those used on aircraft. Col. 1, lines 12- 13." It appears that appellant is arguing non analogous art.

First, in response to Appellant's argument that LAGRONE is nonanalogous art, it is noted that a similarity in the structure between LAGRONE and the current application is that both take an exhaust fuel gas from a compressor to drive an ejector.

Secondly, in response to Appellant's argument that LAGRONE is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the prior art reference is in the field of appellant's endeavor, fuel delivery system.

For support it is noted that instant claim 25 has the phrase, "wherein the recompressed gases exiting from the compression units are used as **fuel** gases." (bolding added for emphasis) Also, LAGRONE states at the abstract "fuel delivery system."

Thirdly, in this case LAGRONE is reasonably pertinent to the particular problem with which the Appellant was concerned. A problem trying to be solved by Appellant as noted at instant specification page 3 is providing static equipment in place of rotary machines because of a higher availability. RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, provides extrinsic evidence at page 167 that ejectors have no moving parts (i.e. static), and the ejectors have no rotating parts. Therefore, one would have been drawn to references with ejectors such as LAGRONE, since they describe ejectors that have no moving parts (i.e. higher availability).

Fourthly, in this case LAGRONE is reasonably pertinent to the particular problem with which the Appellant was concerned. A problem trying to be solved by Appellant as noted at instant specification page 3 "space occupied on the deck." RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, provides extrinsic evidence at page 167 that ejectors have smaller sizes of equipment. Therefore, one would have been drawn to references with ejectors such as LAGRONE, since ejectors have smaller sizes of equipment (i.e. less space occupied on the deck).

Fifthly, in this case LAGRONE is reasonably pertinent to the particular problem with which the Appellant was concerned. A problem trying to be solved by Appellant as noted at instant specification page 3 is "maintenance costs." RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, provides extrinsic evidence at page 167 that ejectors have less maintenance requirements. Therefore, one would have been drawn to references with ejectors such as LAGRONE, since ejectors have less maintenance requirements.

Appellant argues at page 9 paragraph 3-page 10 second paragraph (and page 5 last paragraph), "First, the exhaust gases from the compressors of Aarebrot et al., already had a predefined and absolutely central purpose - to be reinjected into the reservoir. If

these gases instead have to be redirected to an ejector unit added to the Sands et al, system as the Office Action asserts, then they would appear to vitiate, or at the very least hamper, the purpose of the Aarebrot et al. ejection gases. In other words, using the compression gas as a driving fluid from the Sands et al. system modified by Aarebrot et al. appears inconsistent with Aarebrot et al. and undermines the purpose of Aarebrot et al., which was expressly concerned about not having enough gas available for reinjection. Accordingly, Aarebrot et al. and Lagrone are at odds with each other and would not be combined by a person of ordinary skill in the art. To emphasize the importance of the Aarebrot et al. reference to the Office Action's rejection, the Office Action also again stated on page 29 that Aarebrot et al. teaches a gaseous driving fluid exiting from the last compression stage. However, as pointed out above, the "driving fluid" identified by the Examiner was destined in Aarebrot et al. for a very specific purpose of reinjection into the reservoir, not driving an ejector. Diverting the fluid to an ejector would harm the purpose of Aarebrot et al.

Respectfully, the Examiner does not find this argument persuasive. It is pointed out that the ejector driving fluid is recycled back to the compressor of AAREBROT. So, the ejector driving fluid can still be reinjected, and a case of hampering or vitiate does not exist.

LAGRONE clearly teaches at the figure the driving fluid (58) from the compressor (40) being recycled straight back to the compressor (40), via the ejector and flow path (36). And, with the combination made in the last rejection the driving fluid can still be injected into the reservoir. So, this is contradictory to

the Appellants assertion that diverting the fluid to an ejector would vitiate the purposes of AAREBROT et al.

In fact, motivation from LAGRONE to provide an ejector to pump fluid supports the purposes of AAREBROT et al., because the ejector of LAGRONE aids the device of AAREBROT et al. in receiving the fluid that it works upon. (See Abstract of AAREBROT et al.) Providing the ejector (i.e. compressor) of LAGRONE in the last rejection aids in supplying fluid to the device of AAREBROT et al. So, this is contradictory to the Appellants assertion that diverting the fluid to an ejector would vitiate the purposes of AAREBROT et al.

Appellant argues at page 10 third paragraph, "In addition, a person of ordinary skill in the art of marine oil field recovery would not look to the art of fuel delivery systems as in Lagrone to add the final missing element, ejectors, to the system of Sands et al. In an earlier Office Action of September 28, 2009, the 2009 Office Action asserted that Lagrone was properly considered analogous because the gas turbines disclosed could be used for applications other than aircraft. However, Appellant respectfully submits that a general statement that a technology has other uses is not an affirmative teaching or suggestion to use a particular technology in any application other than the ones expressly suggested. Further, in the outstanding Office Action of March 3, 2010, the Office Action pointed to the present claim 25 which states that the recompressed gases are used as fuel gases as evidence that Lagrone is analogous art. Appellant respectfully

submits that the fuel gases referred to in claim 25 are a different gas than the driving fluid for the ejector and therefore claim 25 also does not support making Lagrone analogous art."

Respectfully, the Examiner does not find this argument persuasive.

Besides the other reasons listed above for LAGRONE to be analogous art, the field of "marine oil field recovery" is in the field of "fuel delivery systems." Therefore, the Appellant has actually supported that LAGRONE is in the same field as SANDS, which is contradictory to Appellant's assertion.

Appellant argues at page 10 third paragraph, "Applicant respectfully submits that the fuel gases referred to in claim 25 are a different gas than the driving fluid for the ejector and therefore claim 25 also does not support making Lagrone analogous art.".

Respectfully, the Examiner does not find this argument persuasive. The Appellant has not provided a showing that a difference exists. Based upon the lack of evidence, it is assumed that no significant difference does exist.

Appellant argues at page 10 last paragraph – page 11 first paragraph, "As a final observation, Applicant notes that the field of oil recovery is quite old and has been in existence for many decades. For example, the Holm patent published in 1963. As the Office Action notes with its numerous cited references, ejectors have also been used in

other areas of the oil business for at least 20 years. If it was indeed obvious to add ejectors driven by compression gas to a marine oil platform as the Office Action presently asserts, If it was indeed obvious to add ejectors driven by compression gas to a marine oil platform as the Office Action presently asserts, then why was it not done before? Applicant respectfully submits that the reason is simple - the claimed process was in fact not obvious, and the failure to use ejectors as presently claimed in the oil field art prior to Applicant's invention supports the non-obviousness of the invention."

Respectfully, the Examiner does not find this argument persuasive.

In response to Appellant's argument based upon the age of the references, contentions that the reference patents are old are not impressive absent a showing that the art tried and failed to solve the same problem notwithstanding its presumed knowledge of the references. See *In re Wright*, 569 F.2d 1124, 193 USPQ 332 (CCPA 1977).

Furthermore, the Appellant asserts that "the failure to use ejectors as presently claimed in the oil field art prior to Applicant's invention." Respectfully, the Appellant has failed to provide a showing that there actually was a "failure to use ejectors as presently claimed in the oil field art prior to Applicant's invention."

Also, the mere chance that there might have been a "failure to use ejectors as presently claimed in the oil field art prior to Appellant's invention" with an absence of evidence, besides merely the age of some references, is not a sufficient showing that there actually was art that tried and failed to solve the same problem.

Appellant argues at page 11 second paragraph, "Applicant submits that the first rejection impermissibly picks and chooses elements from various prior art references without regard to the source or purpose for each feature and the effect that the combination of references have on one another and is based on impermissible hindsight."

Respectfully, the Examiner does not find this argument persuasive.

In response, the MPEP states at 2141, " "[I]n Sakraida v. AG Pro, Inc., the Court derived . . . the conclusion that when a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious." Id. at ___, 82 USPQ2d at 1395-96 (Internal quotations omitted.). The principles underlining these cases are instructive when the question is whether a patent application claiming the combination of elements of prior art would have been obvious. The Supreme Court further stated that:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the

technique is obvious unless its actual application is beyond his or her skill. Id. at ___, 82 USPQ2d at 1396."

Respectfully, it has been shown that the claimed invention merely arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement.

Also, in response to Appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Appellant argues at page 11 third paragraph, "this second ground of rejection must be reversed for the same reasons as the first ground of rejection must be reversed."

Respectfully, the Examiner does not find this argument persuasive for at least the reasons provided above.

Appellant argues at page 11 third paragraph, "In particular, the second ground of rejection still relies on the combination of Sands, Aarebrot et al., Holm, and Lagrone which is improper for the reasons provided above with respect to the first ground of rejection. "

Respectfully, the Examiner does not find this argument persuasive. The second ground of rejection does not solely rely on " Sands, Aarebrot et al., Holm, and Lagrone."

The second ground of rejection relies on CHOI for the ejector. And, CHOI is certainly in the field of oil recovery. It is noted that CHOI states at column 1 lines 6-8, "The transportation of hydrocarbons produced from subsea wells is an integral part of offshore hydrocarbon production operations."

Furthermore, the second grounds of rejection provided an alternative rejection "Alternatively, it would have been obvious to one having ordinary skill in the art at the time invention was made to try wherein the driving fluid of each single ejector is the compressed gas exiting from a last compression stage of the reinjection gas compression unit, since there was a finite number of identified predictable solutions." (See last rejection page 20 last paragraph)

Additionally, in support of the Examiner's position it is noted that an ejector requires a driving fluid to function. (For additional support see extrinsic evidence RICHENBERG et al. "Ejectors, Steam Jet" of Encyclopedia of Chemical Processing and Design, vol 17, page 167)

Appellant argues at page 11 third paragraph-page 12 first paragraph," Choi, Webb, and Johnston do not provide a basis for using the gases exiting from a compression stage as a driving fluid for each ejector."

Respectfully, the Examiner does not find this argument persuasive.

As stated in the last rejection of 3 March 2010 at page 18 last paragraph,

[WEBB (US 5,195,587) provides extrinsic evidence at the abstract and the figures an oil field production system with an ejector (43). Also, WEBB (US 5,195,587) provides extrinsic evidence at the figures and column 4 lines 50-55 passing the gas entrained water from an ejector into a reinjection system for injecting these fluids into an underground formation.]

Furthermore, WEBB clearly teaches particularly at figure 1, column 2 lines 64-66 and column 3 lines 16-22 using the fluids exiting from a compression stage (53) as a driving fluid for each ejector (43). This is contrary to Appellant's assertion.

As stated in the last rejection of 3 March 2010 at page 19 second paragraph,

[JOHNSTON (US 4,967,559) provides extrinsic evidence at the title and the figures a geothermal power plant with well reinjection (i.e. a reinjection

system). Also, JOHNSTON provides extrinsic evidence at column 4 lines 64-67 of steam jet gas ejectors used; and steam jet gas ejectors are an alternative to mechanical gas compressors to compress gases.]

JOHNSTON was provided for an alternative rational for substituting the compressors of SANDS et al. with an ejector compressor.

Appellant argues at page 12 second paragraph, "this second ground of rejection must be reversed for the same reasons as the first ground of rejection must be reversed."

Respectfully, the Examiner does not find this argument persuasive for at least the reasons provided above.

Furthermore, it is noted that claim 27 is an apparatus claim and not a process claim. Different precedent is applicable to an apparatus claim 27 as compared to a process claim 15.

Appellant argues at page 12 third paragraph- fifth paragraph, "the Office Action relies on Aarebrot et al. to add the reinjection gas compression unit and Lagrone to add the ejector to the system of Sands et al. This combination once again fails for the same reasons as with respect to the first ground of rejection."

Respectfully, the Examiner does not find this argument persuasive for at least the reasons provided above.

Furthermore, claim 27 is not commensurate in scope with claim 15.

Appellant argues at page 12 fifth paragraph, "it would not be obvious to a person of ordinary skill in the art to look to Lagrone to add an ejector to the compression unit of Aarebrot et al. when the compressed gas of Aarebrot et al. is already destined for reinjection back into the oil field."

Respectfully, the Examiner does not find this argument persuasive. The Appellant is not arguing the rejection made. AAREBROT et al. is not the base reference. SANDS et al. is the base reference. Also, the rejection provided the type of compression unit of LARGRONE (i.e. an ejector) in place of the compressors (5 and 6) of SANDS et al.

It is pointed out that the ejector driving fluid is recycled back to the compressor of AAREBROT. So, the ejector driving fluid can still be reinjected, and a case of hampering or vitiate does not exist.

LAGRONE clearly teaches at the figure the driving fluid (58) from the compressor (40) being recycled straight back to the compressor (40), via the ejector and flow path (36). And, with the combination made in the last rejection the driving fluid can still be injected into the reservoir. So, this is contradictory to the Appellants assertion that diverting the fluid to an ejector would vitiate the purposes of AAREBROT et al.

In fact, motivation from LAGRONE to provide an ejector to pump fluid supports the purposes of AAREBROT et al., because the ejector of LAGRONE

aids the device of AAREBROT et al. in receiving the fluid that it works upon. (See Abstract of AAREBROT et al.) Providing the ejector (i.e. compressor) of LAGRONE in the last rejection aids in supplying the fluid to the device of AAREBROT et al. So, this is contradictory to the Appellants assertion that diverting the fluid to an ejector would vitiate the purposes of AAREBROT et al.

Appellant argues at section C, "the third ground of rejection must also be reversed for reasons similar to the first ground of rejection."

Respectfully, the Examiner does not find this argument persuasive for at least the reasons provided above.

Furthermore, claim 27 is not commensurate in scope with claim 15.

Appellant argues at section D, "the fourth ground of rejection must be reversed for the same reasons as the third ground of rejection must be reversed."

Respectfully, the Examiner does not find this argument persuasive for at least the reasons provided above.

Appellant argues at section D, "the second ground of rejection still relies on the combination of Sands, Aarebrot et al., Holm, and Lagrone which is improper for the reasons provided above with respect to the first ground of rejection. The three additional

references also do not overcome the problems described with the first rejection as discussed above with respect to the second rejection.."

Respectfully, the Examiner does not find this argument persuasive for at least the reasons provided in the above sections.

Furthermore, in support of the Examiner's position it is noted that the last rejection dated 3 March 2010 states at page 27 last paragraph and page 28 [WEBB (US 5,195,587) provides extrinsic evidence at the abstract and the figures an oil field production system with an ejector (43). Also, WEBB (US 5,195,587) provides extrinsic evidence at the figures and column 4 lines 50-55 passing the gas entrained water from an ejector into a reinjection system for injecting these fluids into an underground formation.]

[JOHNSTON (US 4,967,559) provides extrinsic evidence at the title and the figures a geothermal power plant with well reinjection (i.e. a reinjection system). Also, JOHNSTON provides extrinsic evidence at column 4 lines 64-67 of steam jet gas ejectors used; and steam jet gas ejectors are an alternative to mechanical gas compressors to compress gases.]

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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